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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/499,525	02/10/2000	Hong Heather Yu	9432-000086	1397

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EXAMINER

JACKSON, JAKIEDA R

ART UNIT	PAPER NUMBER
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2655

DATE MAILED: 02/05/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/499,525

Applicant(s)

YU ET AL.

Examiner

Jakieda R Jackson

Art Unit

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 February 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Drawings*

1. This application has been filed with informal drawings, which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

### *Claim Objections*

2. **Claim 12** is objected to because of the following informalities:
- **Claim 12** has a typographical error resulting in improper dependence or no antecedent basis. For examination purposes the following apparently intended interpretations have been made that claim 12 depends on claim 11.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 1, 5, 7-8, 10-12 and 14-16** are rejected under 35 U.S.C. 102(e) as being

*anticipated*  
~~anticipated~~ by Tewfik et al. (U.S. Patent No. 6,442,283), hereinafter referenced as

Tewfik.

Regarding **claims 1 and 11**, Tewfik discloses a computer implemented method and apparatus for embedding hidden data (watermark; column 1, lines 36-54) in an audio signal (column 5, lines 40-43), comprising the steps of:

receiving the audio signal in a base domain (time domain; column 7, lines 27-38);  
transforming the received audio data to a non-base domain (discrete cosine transform domain (DCT); column 4, lines 48-50)

embedding the hidden data in the transformed non-base domain (DCT; column 4, lines 42-59) via parametric representation of the audio signal (column 9, lines 51-62).

Regarding **claim 2**, Tewfik discloses the method and apparatus further comprising:

transforming the received audio signal to the non-base domain (column 4, line 48 – column 5, line 9) such that transform domain coefficients (DCT coefficients) are generated that are indicative of the transformed non-base domain audio signal (F-value; column 9, lines 24-26).

Regarding **claims 3 and 12**, Tewfik discloses the method and apparatus further comprising:

transforming the received audio signal to the non-base domain (column 4, line 48 – column 5, line 9) such that transform domain coefficients (DCT coefficients) are generated that are indicative of the transformed non-base domain audio signal (F-value; column 9, lines 24-26).

manipulating the statistical measure (statistical F-test; column 9, lines 6-30) of a selected subset of the transform domain coefficients in order to embed the hidden data

(column 5, lines 1-9).

Regarding **claim 4**, Tewfik discloses the method and apparatus further comprising:

modulating the embedded data (figure 3, element 304) with at least one predetermined statistical feature of the transformed non-base domain audio signal (column 11, lines 1-11).

Regarding **claim 5**, Tewfik discloses the method and apparatus further comprising:

increasing the amplitude (change in amplitude; column 8, lines 48-62) of at least one predetermined feature of the transformed non-base domain audio signal so that statistical mean of the predetermined feature is positive for embedding a bit of one in the audio signal (column 3, lines 24-36 and column 4, lines 26-27).

Regarding **claims 7 and 14**, Tewfik discloses the method and apparatus further comprising:

transforming the received audio signal to a cepstrum domain (spectrum base; column 9, lines 11-31); and

embedding the hidden data in the cepstrum domain (spectrum base; column 9, lines 11-31).

Regarding **claims 8 and 15**, Tewfik discloses the method and apparatus further comprising:

using a psycho-acoustic model (MPEG psychoacoustic masking model; to control inaudibility of the embedded data (column 5, lines 9-14).

Regarding **claims 10 and 16**, Tewfik discloses the method and apparatus further comprising:

transforming the received audio signal to a cepstrum domain (column 9, lines 11-31);

embedding the hidden data in the cepstrum domain (column 9, lines 11-31); and  
enforcing a positive mean to embed a "1" and keeping a zero mean intact to embed a "0" in the cepstrum domain (column 4, lines 19-27 and column 11, lines 26-35).

### ***Claim Rejections - 35 USC § 103***

5. following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 6, 9 and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tewfik et al. in view of Sharma et al. (U.S. Patent No. 6,480,825), hereinafter referenced as Sharma.

Regarding **claims 6 and 13**, Tewfik discloses a computer implemented method and apparatus for embedding hidden data in an audio signal but lacks further comprising:

transforming the received audio signal to a Linear Prediction residue domain; and

embedding the hidden data in the Linear Prediction residue domain. Sharma discloses a system and method for detecting a recorded voice comprising:

transforming the received audio signal to a Linear Prediction residue domain (column 17, lines 58-67); and

embedding the hidden data in the Linear Prediction residue domain (column 17, lines 58-67), to use standard feature extraction techniques.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Tewfik's invention such that it transforms the received audio signal to a Linear Prediction residue domain and embeds the hidden data in the Linear Prediction residue domain in order to train pattern classifiers to control distortion and ensure perceptibility (column 17, line 58 – column 18, line 9).

Regarding **claim 9**, Tewfik discloses a computer implemented method and apparatus for embedding hidden data in an audio signal further comprising:

transforming the received audio signal to non-base domain (column 4, lines 48-50)

generating an inverse transformation signal (inverse fourier transform) using the embedded hidden data that is in the transformed non-base domain signal (column 10, lines 40-45);

receiving an attack (shifting) upon the generated inverse transformational signal (column 10, lines 6-21) but lacks wherein the non-base domain is selected from the group consisting of linear prediction residue and cepstrum domain;

transforming the attacked inverse transformation signal to the non-base domain so as to generate a second transformed audio signal that is in the non-base domain; and

extracting the embedded hidden data from the second transformed audio signal that is in the non-base domain. Sharma discloses a system and method for detecting a recorded voice data wherein the non-base domain is selected from the group consisting of linear prediction residue and cepstrum domain (column 17, lines 58-67)

transforming the attacked inverse transformation signal (inverse Fourier transform) to the non-base domain (cepstral domain; column 12, lines 44-66) so as to generate a second transformed audio signal that is in the non-base domain (column 13, lines 26-67); and

extracting the embedded hidden data (figure 4A, element 240) from the second transformed audio signal that is in the non-base domain (column 13, lines 26-67), to obtain an audio sample.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Tewfik's invention such that the non-base domain is selected from the group consisting of linear prediction residue and cepstrum domain, such that the transformed attacked inverse transformation signal is in the non-base domain to generate a second transformed audio signal that is in the non-base domain and such that it extracts from the embedded hidden data from the second transformed audio signal that is in the non-base domain, to obtain an audio sample for



extraction of the channel characteristics or "estimate the channel" for distortion purposes (column 12, lines 23-34).

**Conclusion**

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


- Chen et al. (U.S. Patent No. 6,233,347) discloses a system, method and product for information embedding using an ensemble of non-intersecting embedding generations.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jakieda R Jackson whose telephone number is 703.305.5593. The examiner can normally be reached on Monday through Friday from 7:30 a.m. to 5:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis I. Smits can be reached on 703. 306-3011. The fax phone number for the organization where this application or proceeding is assigned is 703.872.9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.305.4700.

JRJ  
January 29, 2004

  
DORIS H. TO 2/3/04  
SUPERVISORY PATENT EXAMINER  
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